IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Eugene Lee

Group Art Unit: 2815

In re PATENT APPLICATION of
Applicants : Yao et al.)
Serial No. : N/A (parent application No.: 09/521,021))
Filed : Herewith)
For : Alignment Mark Configuration)
Atty Dkt : JCLA5662-CIP)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Office Action dated December 26, 2000 regarding the application No. 09/521,021 filed on March 8, 2000 and entitled "Alignment Mark Configuration". Applicant filed herewith a continuation-in-part (CIP) application thereof.

In the CIP application, the following amendments are made to the parent application No. 09/521,021:

On page 5, line 2, the following sentence is added: -- Preferably, the spacing "D" is from about 5d to 80d, more preferably, from about 5d to 50d. --.

Claim 1 is amended as follows:

1. An alignment mark configuration, which is applicable on a substrate comprising a plurality of layers, the alignment mark configuration comprising:

an alignment mark on the substrate, wherein the alignment mark comprises a plurality of recesses and a spacing between the neighboring recesses is "d"; and

a trench, wherein a spacing between the trench and the alignment mark is in a range between about 5d to 80d.

REMARKS

In order to expedite the prosecution of the present CIP application, Applicant would like to make the following comments to respond the final Office Action issued on the parent application 09/521,021.

Rejections under 35 U.S.C. §102(e)

Claims 1-3 of the parent application (09/521,021). stand rejected under 35 U.S.C. §102(e) as being anticipated by Jang et al. (US 6,043,133).

The present invention as defined in the CIP application provides an alignment mark configuration, wherein damage to the alignment mark due to chemical mechanical polishing is prevented. The alignment mark on the substrate comprises a plurality of recesses. If any type of trench, for example, a shallow trench isolation, is also being formed on the substrate, **the spacing between the trench and the alignment mark is in the range from about five to eighty times the spacing between the recesses**.

The Office Action assumed that the spacing, between the trench 34 around the alignment mark area 18 on the right side of the figure and the alignment mark area on the left side of the figure, is many times greater than the distance d in between the individual grooves of alignment mark area 18 from the figure. The Office Action is correct in this regard. But, the trench 34 around the alignment mark area 18 on the right side of the figure has nothing to do with the alignment mark area 18 on the left side of the figure. They are not totally separated from each other and not related in any way. In the present invention, the trench is the one nearest to the alignment mark. In Jang, no specific relation between the alignment mark and surrounding

trench is given or even mentioned.

Further, in Jang's patent, the alignment marks 30 preferably have a spacing between adjacent alignment area trenches in a range of 6-10 microns (Col. 6, line 8-12). The alignment mark area 18 is preferably square shaped having a width 50 in a range of 0.5-2.0 mm, and more preferably about 1.6 mm. The alignment mark trench 34 has a width 40 in a range of 0.8-2.0mm, and more preferably 0.95mm (Col. 6, line 20-27). From Fig. 2B, the alignment mark area 18 on right side is four square units away from the alignment mark area 18 on the left side. Thus, the spacing, between the trench 34 around the alignment mark area 18 on the right side of the figure and the alignment mark area on the left side of the figure is **at least 520 times** the distance d in between the individual grooves of alignment mark area 18 from the figure. While claim 1 recited that the spacing between the trench and the alignment mark is in **a range from about 5d to 80d**.

Furthermore, it is not proper to consider the alignment trench 34 comparable to the trench isolation structure (STI) mentioned in our invention. It is conventional to leave open space around alignment mark, but the distance between the alignment mark and the surrounding trench isolation structure is never stated in any reference except the present invention. In Jang's patent, the alignment trenches 34, replacing the flat open areas, are formed specifically around the alignment mark area, thus preventing over-polishing around the alignment marks. Therefore, Jang adopts a totally different strategy to solve the prior art problems. Compared with the present invention, even though Jang's invention solves the over-polishing problem, it can not achieve the function and advantages of the present invention. It is because the alignment marks disclosed in Jang's patent occupy much area of the wafer and could not be allowed in many locations to get good overlay results, as critical dimension of the device keeps shrinking.

For at least these reasons, Applicants submit that Jang does not anticipate the present

invention as recited in claims 1-3 and respectfully request that the rejection of claims 1-3 under 35 U.S.C. § 102(e) be withdrawn.

CONCULSION

For at least the above reasons the claims of the present CIP application are believed to be in a condition for allowance and such allowance is respectfully requested. If the examiner disagrees and rejects any claim, then the Examiner is encouraged to contact the undersigned to arrange for a phone interview to better understand, and resolve, any disagreement.

Respectfully submitted,

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